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published in
Journal of Personality and Social Psychology
2000

DOI (link to publisher)
10.1037/0022-3514.79.6.975

document version
Publisher's PDF, also known as Version of record

Journal of Personality and Social Psychology
2000, Vol. 79, No. 6, 975–987

0022-3514/00/$5.00 DOI: 10.1037//0022-3514.79.6.975

Unfixing the Fixed Pie: A Motivated Information-Processing Approach to Integrative Negotiation

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Negotiators tend to believe that own and other's outcomes are diametrically opposed. When such fixed-pie perceptions (FPPs) are not revised during negotiation, integrative agreements are unlikely. It was predicted that accuracy motivation helps negotiators to release their FPPs. In 2 experiments, accuracy motivation was manipulated by (not) holding negotiators accountable for the manner in which they negotiated. Experiment 1 showed that accountability reduced FPPs during face-to-face negotiation and produced more integrative agreements. Experiment 2 corroborated these results: Accountable negotiators revised their FPPs even when information exchange was experimentally held constant. Experiment 2 also showed that accountability is effective during the encoding of outcome information. Negotiators appear flexible in their reliance on FPPs, which is consistent with a motivated information-processing model of negotiation.

In a world where conflict abounds, people must frequently negotiate with others to get what they want, to get along, or even simply to get by. Indeed, successful negotiation is associated with a large number of positive consequences for both the individual and the community at large, including increased relationship satisfaction, long-term stability of interpersonal relationships, peaceful relations between groups, and economic prosperity (Rubin, Pruitt, & Kim, 1994). It therefore comes as no surprise that social scientists have a long-standing fascination with the study of how people use negotiation to resolve their divergent interests and arrive at a mutual understanding (Pruitt, 1998).

As noted by many negotiation experts (Fisher & Ury, 1981; Lax & Sebenius, 1986; Raiffa, 1982), successful negotiation is not only highly desirable but also difficult to achieve. The difficulty of negotiation is illustrated by the ubiquitous occurrence of conflict escalation, ranging from large-scale international conflicts (Baumeister, 1997; Brown & Rosecrance, 1999; Cranna, 1994), to small-scale—but no less tragic—cases of domestic violence like wife battering and child abuse (see, e.g., Baumeister, Smart, & Boden, 1996; Tjosvold, Tjosvold, & Tjosvold, 1991). Corroborating everyday observations, negotiation researchers have found that negotiators frequently reach outcomes that are suboptimal by normative standards (Raiffa, 1982). Researchers have pointed to negotiators' inclination to base their judgments and behaviors on faulty beliefs and inappropriate sources of information as a major underlying cause of the apparent difficulties that people experience in negotiation (see, e.g., Neale & Bazerman, 1991). For example, negotiators have been found to rely on the representational format of the negotiation outcomes (Bazerman & Neale, 1983; De Dreu & McCusker, 1997), stereotypic information about other parties (De Dreu, Yzerbyt, & Leyens, 1995), and momentarily accessible anchor values (De Dreu, Koole, & Oldersma, 1999; Northcraft & Neale, 1987).

Among the various cognitive barriers to successful negotiation, one stands out as being especially self-defeating and hence particularly worrisome. Specifically, there exists a tendency among negotiators to view own priorities and those of the other party as diametrically opposed (Schelling, 1960). Such a fixed-pie bias (Bazerman & Neale, 1983) and associated fixed-pie perceptions (L. L. Thompson & Hastie, 1990) imply an egocentric disregard of the other party, in that other's preferences are seen as the mere mirror image of one's own preferences. Consequently, reliance on fixed-pie perceptions may cause people to overlook the benefits that are associated with own–other differences in priorities. For example, a potential car buyer may be very concerned about the price of a new car but be indifferent about the delivery time. To the salesperson, however, the delivery time may be very important and getting the advertised price on the car may be a lesser concern. Accordingly, different patterns of priorities yield *integrative potential,* situations in which opposing negotiators can both attain high outcomes. Unfortunately, when such integrative potential

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This research was financially supported by a grant from the Royal Netherlands Academy of Sciences.

We thank Gerben van Kleef for his help in conducting Experiment 2 and Daan van Knippenberg for his comments on a draft of this article.

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goes unrecognized, the negotiators generally reach a suboptimal agreement. Consistent with this, research has linked reliance on fixed-pie perceptions to suboptimal negotiation outcomes (L. L. Thompson, 1991; L. L. Thompson & Hastie, 1990).

In spite of their apparently self-defeating consequences, fixed-pie perceptions appear to be commonly held among negotiators and seem quite resistant to change. Indeed, many negotiators hold on to their faulty fixed-pie perceptions even after extensive face-to-face contact with the other party (L. L. Thompson & Hastie, 1990). The persistence of fixed-pie perceptions, in conjunction with their potential destructiveness, constitutes an important rationale for investigating factors that may assist in the appropriate revision of fixed-pie perceptions. In the present research, we considered whether accuracy motivation would induce negotiators to pay more attention to the other party's preferences and thus release their invalid fixed-pie perceptions. As an outline of the things to come, we begin by discussing past research on fixed-pie perceptions in negotiation in some greater detail. After this, we turn to more recent research on motivational influences on the use of cognitive heuristics and discuss the relevance of the distinction between social motivation (De Dreu & Van Lange, 1995) and nondirectional motives, such as accuracy motivation. Finally, we present two experiments that were designed to test our theoretical analysis.

Fixed-Pie Perceptions in Negotiation

At a general level, studying negotiators' insight into the preferences of the other party can be related to the broader issue of accuracy in person perception. Social psychology has had a long-standing interest in studying the factors that determine the accuracy of people's perceptions of others (see, e.g., Funder, 1987, 1995; Gilbert, 1998; Hastie & Rasinski, 1988; Kruglanski, 1989). Much of the social psychological debate on the accuracy of person perception has centered around the question of how accuracy should be defined and operationalized (see, e.g., Funder, 1987, 1995; Hastie & Rasinski, 1988). Although this debate has some important philosophical implications (see, e.g., Kruglanski, 1989), the operationalization of accuracy appears less problematic in the context of negotiation research, where the other's payoff structure can be objectively determined (and even manipulated) in a relatively straightforward manner (Kelley & Thibaut, 1978). As such, negotiation paradigms offer a pragmatic solution to the study of psychological issues surrounding the accuracy of social perception.

Early investigations of fixed-pie perceptions were conducted by Pruitt and Carnevale (e.g., Carnevale & Isen, 1986; Kimmel, Pruitt, Magenau, Konar-Goldband, & Carnevale, 1980; O'Connor, 1997; O'Connor & Carnevale, 1997) who assessed the negotiators' perceptions of other's pay-offs immediately after the negotiation. Other research has developed more sophisticated measures of fixed-pie perceptions and also assessed fixed-pie perceptions both before and after the negotiation (see, e.g., L. L. Thompson & Hastie, 1990). Typically, this research has provided negotiators before interaction with their potential pay-offs on a number of issues, and these potential pay-offs have been manipulated in such a way that a party's gains on a particular issue do not equal the opposing party's losses on that issue. However, individual negotiators have not been shown the opposing parties' pay-offs on a particular issue. At the outset (and sometimes at the end) of the negotiation, participants are asked to estimate the other's pay-offs on each of the issues under negotiation. The more these estimates are diametrically opposed to the negotiator's own pay-offs, the more he or she is assumed to have a fixed-pie perception. The more these estimates match the opponent's true pay-offs, the more accurately negotiators perceive integrative potential (Pruitt & Carnevale, 1993; L. L. Thompson & Hastie, 1990).

Research using this task has documented that, as mentioned, a substantial majority of individuals enter the negotiation with a fixed-pie perception (see, e.g., Pinkley, Griffith, & Northcraft, 1995; L. L. Thompson & Hastie, 1990). Given that, in this paradigm, negotiators did not possess a priori information about the other party's preferences, one may argue that finding fixed-pie perceptions in the early stages of the negotiation is somewhat of an artifact. After all, these negotiators do not have anything else to go on besides their own pay-off schedule to estimate other's preferences at the outset of the negotiation. Pruitt and Carnevale (1993, pp. 86–87) suggested that labeling the task negotiation encourages the fixed-pie assumption because the usual stereotype of negotiation is of a heavily contentious interchange, whereas the reality often involves subtle problem solving. Some indirect evidence for this explanation comes from a study by Neale and Northcraft (1986) that showed that sophisticated negotiators (experts) are less affected by fixed-pie perceptions than naïve negotiators such as students in laboratory experiments. Alternatively, this finding may reflect a genuine psychological phenomenon, which consists of projecting one's self-attributes onto the other when information about the other is vague or ambiguous (Harinck, De Dreu & Van Vianen, 2000; Krueger, 1998). In any case, given the near-universal prevalence of fixed-pie perceptions at the outset of the negotiation, negotiation success would seem to depend predominantly on the extent to which negotiators revise their unfounded fixed-pie perceptions. Unfortunately, research indicates that in many cases, fixed-pie perceptions are maintained throughout the negotiation, leaving much integrative potential unexploited (Thompson & Hrebec, 1996).

Given that normal (i.e., nonclinical) people generally do not engage in self-destructive behavior on purpose (Baumeister & Scher, 1988), it appears that some psychological obstacles may conspire against the appropriate revision of fixed-pie perceptions in negotiation. One such obstacle may lie in the negotiator's limited information-processing capacity (Neale & Bazerman, 1991). The negotiator's task is particularly complex and ambiguous. Successful negotiators must have attained at least some understanding of their own interests, must keep those interests in mind during the negotiation, and must get them across to the other party. At the same time, they must pay attention to what the other is saying, doing, and otherwise communicating; must keep these things in mind as well; and must try to figure out what they mean in terms of the other's underlying interests. On the basis of this understanding, negotiators must then work out some kind of a solution that is likely to lead to an agreement. Although this only scratches the surface of the actual information processing that goes on in even the simplest of negotiations, it should be clear that the sheer complexity of the negotiation task is overwhelming. Accordingly, negotiators may cling to fixed-pie perceptions because they simplify the negotiation situation, even when they are faulty.

Motivation in Negotiation

Although the limited-capacity account is theoretically plausible, it cannot offer a complete explanation for inappropriate persistence of fixed-pie perceptions. In particular, several experiments have shown that encouraging negotiators to exchange information about their preferences leads to decreased fixed-pie perceptions and to higher joint outcomes (Kemp & Smith, 1994; L. L. Thompson, 1991). Such findings are difficult to understand if one assumes that negotiators rely on fixed-pie perceptions because they would otherwise be overloaded with information. If this were correct, exhortations to engage in information exchange would only risk an additional increase in information overload, especially if one considers that information implying differences between own and other's preferences is unexpected and that paying attention to unexpected information usurps cognitive resources (Macrae, Bodenhausen, Schloerscheidt, & Milne, 1999). Accordingly, this research suggests that much of the persistence in fixed-pie perceptions stems from negotiators' reluctance to exchange information regarding their preferences, as well as from their reluctance to process the information that becomes available during negotiation.

Whether negotiators exchange information about preferences and priorities is strongly contingent on their *social motivation* to search for good outcomes for themselves (an egoistic motivation) or to search for good outcomes for themselves and their opponent (a prosocial motivation). A prosocial rather than individualistic motivation produces trust and stimulates the exchange of information about preferences and priorities (De Dreu, Weingart, & Kwon, 2000; Deutsch, 1973; Pruitt, 1981; Pruitt & Carnevale, 1993). Accordingly, Pruitt (1990) argued that an individualistic motivation leads to a win–lose attitude with concomitant fixed-pie perceptions. When negotiators have a prosocial motivation, they are less likely to adopt a win–lose attitude and more likely to exchange information, to subsequently revise their fixed-pie perceptions, and, consequently, to reach more integrative agreements. Although this reasoning seems plausible, Pruitt's analysis has thus far received only weak support in empirical studies. Carnevale and Isen (1986) observed fewer fixed-pie perceptions when negotiators had a prosocial rather than an individualistic motivation. Gelfand and Christakopoulou (1999) found that negotiators with individualistic values (U.S. citizens) were less likely to exchange information and to change their fixed-pie perceptions than negotiators with prosocial, collectivist values (Greek citizens). However, O'Connor (1997), O'Connor and Carnevale (1997), and Kimmel et al. (1980) failed to find effects of social motivation on fixed-pie perceptions.

The mixed evidence for Pruitt's argument suggests that the revision of fixed-pie perceptions may depend not only on the exchange of information, which is contingent upon negotiators' social motivation, but also on the extent to which negotiators process this information. The extent to which people process information depends on their *nondirectional motivation*—that is, their motivation to form an accurate and reasonable impression, rather than one predisposed toward any particular conclusion.[1] Nondirectional motivation is central to so-called dual-process models (for discussions, see Chaiken & Trope, 1999; Kruglanski & Thompson, 1999; Smith & DeCoster, in press). These models share the assumption that individuals can choose from two alternative strategies for processing information. The first strategy is to solve logical problems, to evaluate persuasive arguments, or to form impressions of others through a quick, effortless, and heuristic processing of information that rests on well-learned prior associations. Alternatively, individuals may engage in more effortful, deliberate, and systematic processing that involves rule-based inferences (Brewer, 1988; Chaiken, 1987; Kruglanski & Webster, 1996; Petty & Cacioppo, 1986).

Individuals are more likely to engage in the systematic processing of information when their nondirectional motivation is high rather than low. Attitude research has shown that people engage in more effortful, systematic screening of the persuasive message when they feel a strong need to be accurate. This need to be accurate is higher when the topic is personally involving, when personal consequences are important, or when one is held accountable for one's judgments and decisions (Eagly & Chaiken, 1993; Petty & Cacciopo, 1986). Person perception research has shown that people are less likely to base their judgments and decisions on prior-held stereotypes and instead develop a more accurate and individuated impression when the target of judgment is motivationally relevant (Brewer, 1988; Fiske & Neuberg, 1990). For instance, people engage in more effortful, systematic processing of person information when they depend on the target of judgment (see, e.g., Neuberg & Fiske, 1987). Finally, individual decision-making research has shown that people engage in more systematic, thorough processing of information when the process or outcomes of those decisions are subject to potential criticism. When decision makers are held accountable by others, they feel an urge to preempt potential criticism and engage in thorough, systematic processing of information (Lerner & Tetlock, 1999; Tetlock, 1992).

In recent years, notions from dual-process models have been shown to generalize to situations involving social interaction in general and negotiation in particular (De Dreu et al., 1999; De Grada, Kruglanski, Mannetti, & Pierro, 1999; L. L. Thompson, 1995). Of specific interest to the current research is a recent study by L. L. Thompson (1995). In this study, participants observed videotaped negotiations between two individuals, one representing the participant's position and the other representing the opposing position. The participant's task was to provide estimates of the opposing negotiator's preferences and priorities. When participants were held accountable for their judgmental process, their judgments were rather accurate. When participants were not held accountable, their judgments tended to reflect fixed-pie perceptions. Unfortunately, this study by L. L. Thompson did not involve actual negotiation between participants. Thus, it remains to be seen whether results generalize to actual negotiation where participants interact in a complex, ambiguous, and noisy situation. In addition, because participants in her study did not negotiate, the consequences for revisions in fixed-pie perceptions for joint outcomes from the negotiation could not be assessed.

[1] Nondirectional motivation resembles accuracy motivation (Chaiken & Trope, 1999), need for cognition (Petty & Cacioppo, 1986), and need for cognitive closure (Kruglanski & Webster, 1996). Although specific differences between these concepts may exist, they are assumed in the current research to be functionally equivalent and can be used interchangeably.

Overview of the Present Research

Individuals tend to enter the negotiation with fixed-pie perceptions, and when they do not change these perceptions during negotiation, integrative agreements are unlikely. Past research provides some support for the idea that social motivation leads negotiators to revise their fixed-pie perceptions. We suspected that information exchange, which is contingent on social motivation, might not be sufficient to counter fixed-pie perceptions. On the basis of dual-process models, we argued that nondirectional motivation to engage in systematic processing of information is needed for fixed-pie perceptions to be revised during negotiation.[2] It could be that through more careful processing of information, negotiators might be able to go beyond their fixed-pie perceptions to develop a more accurate understanding of the opposing negotiator's preferences and priorities and to reach more mutually beneficial, integrative agreements.

To test this general hypothesis, we conducted two experiments. In both experiments, we measured fixed-pie perceptions prior to and at the end of negotiation, allowing us to detect any changes in negotiator perceptions during negotiation. In both experiments, we established differences in the negotiator's nondirectional motivation by manipulating *process accountability* (Simonson & Staw, 1992). Under process accountability, individuals expect to be observed and evaluated by others with unknown views about the process of judgment and decision making (Lerner & Tetlock, 1999; Tetlock, 1992). Simonson and Staw (1992) argued that individuals under process accountability tend to engage in preemptive self-criticism, leading to more evenhanded evaluation of decision alternatives and reduced need for self-justification. Although process accountability has, as far as we know, not been studied in face-to-face negotiation, individual decision-making research suggests that

> accountability attenuated bias on tasks to the extent that (a) suboptimal performance resulted from lack of self-critical attention to the judgmental process and (b) improvement required no special training in formal decision rules, only greater attention to the information provided. (Lerner & Tetlock, 1999, p. 263)

Experiment 1 was designed to test the basic notion that negotiators under process accountability revise their fixed-pie perceptions to a greater extent than negotiators not held accountable, allowing the former to reach more integrative agreements. Experiment 2 was designed to obtain a more fine-grained insight into the impact of process accountability on information processing in negotiation.

Experiment 1

Experiment 1 was conducted to test three specific hypotheses. Hypothesis 1 predicted that at the end of the negotiation, negotiators under process accountability would have more accurate perceptions (and fewer fixed-pie perceptions) than negotiators who were not held accountable. Hypothesis 2 predicted that negotiators under process accountability would achieve more integrative agreements than negotiators not held accountable. Hypothesis 3, finally, predicted that the greater number of integrative agreements reached by negotiators under process accountability would be due to the development of more accurate perceptions during negotiation.

Method

Participants and experimental design. One hundred and two male and female business students participated in the experiment for which they received 15 Dutch guilders (approximately U.S. $8). Process accountability (present vs. absent) was manipulated between dyads. The dependent variables were fixed-pie perceptions before and after the negotiation, information exchange and competitive behavior during negotiation, joint outcomes, and social motivation (i.e., whether negotiators adopted an egoistic vs. prosocial goal). Competitive behavior, information exchange, and social motivation were included for exploratory reasons (see also under *Dependent measures,* below).

Procedure. The procedure was similar to the one used by L. L. Thompson and Hastie (1990). Same-sex participants came in even numbers to the laboratory where they were randomly paired with each other (under the restriction that they did not know one another). They received a written information package containing negotiation materials (role instructions, background information, profit sheets) and information intended to manipulate process accountability. They were asked to read these materials carefully, and any questions they had were answered as well as possible. Only when the experimenters were convinced that all participants fully understood the task were dyads taken to adjacent "negotiation offices." Dyad members were seated in front of each other at a large table, separated by a 10" × 150" wooden partition preventing participants from seeing each other's profit schedules and notes. A microphone was attached to the table for recording purposes. Participants were given a maximum of 20 min to reach agreement. On agreement or when time ran out, participants filled out a short questionnaire and were debriefed.

Manipulation of process accountability. Prior to the negotiation, participants in the process accountability condition received a special memo. The memo explained that within a few days after the study, interview sessions would be conducted by an experienced negotiator and a psychologist interested in "the ways you negotiated, the decisions you made, the procedures you followed, and why you pursued or dropped particular strategies." Participants were asked to write down two times they were available for such an interview and to authorize the use of tape recordings from the negotiation for this particular interview (all participants complied). Finally, participants in the process accountability condition received a sheet of paper entitled "accountability interview" that they could use to take notes on during negotiation that "they felt that might be useful during the interview." Participants in the control condition did not receive the special memo or any other information about the interview. They were asked only to authorize the use of the tape recordings for scientific purposes.

Negotiation task. The task was the same as the one employed by L. L. Thompson and Hastie (1990) and concerned the purchase of a car. Buyer and seller were required to reach agreement on interest, stereo equipment, warrantee, and delivery. On each of these four issues, interests were opposed. However, not all issues were equally important to a particular negotiator, and issue priority differed between buyer and seller (i.e., interest was least important to the buyer and most important to the seller, whereas the reverse held for warrantee; see Table 1). Thus, there was integrative potential in that settlement on 10% interest, Type C stereo, 30 months warrantee, and 3 weeks delivery time yielded higher joint outcomes (i.e., 8,000, with 4,000 to each individual negotiator) than an equal-split compromise on all four issues (i.e., 5,600, with 2,800 to each negotiator).

Participants were motivated to take the negotiation seriously by being told that points they obtained from the negotiation would be converted into

[2] A study by De Dreu et al. (1999) revealed that social motivation (i.e., social value orientation) was unrelated to nondirectional motivation (i.e., need for cognitive closure), suggesting that prosocial or individualistic negotiators did not necessarily differ in the extent to which they engage in systematic and thorough processing of information.

Table 1
Profit Schedules for Buyer and Seller

Interest	Stereo	Warrantee	Delivery
	Buyer's profit schedule		
10% (0)	Type A (−2,400)	6 months (0)	5 weeks (0)
8% (400)	Type B (−1,800)	12 months (1,000)	4 weeks (600)
6% (800)	Type C (−1,200)	18 months (2,000)	3 weeks (1,200)
4% (1,200)	Type D (−600)	24 months (3,000)	2 weeks (1,800)
2% (1,600)	Type E (0)	30 months (4,000)	1 week (2,400)
	Seller's profit schedule		
10% (4,000)	Type A (0)	6 months (1,600)	5 weeks (2,400)
8% (3,000)	Type B (−600)	12 months (1,200)	4 weeks (1,800)
6% (2,000)	Type C (−1,200)	18 months (800)	3 weeks (1,200)
4% (1,000)	Type D (−1,800)	24 months (400)	2 weeks (600)
2% (0)	Type E (−2,400)	30 months (0)	1 week (0)

Note. Buyer and seller saw only their own profit schedules and were not permitted to exchange them. Numbers in parentheses are the point values of a given option for the particular participant.

lottery tickets and that these lottery tickets would enter them in a draw for a cash prize of 100 guilders (approximately U.S. $50). Thus, the more points negotiators obtained, the more lottery tickets they would get and the greater their chances would be of winning a cash prize. No indications were given about the best strategy to obtain points.

Dependent measures. Fixed-pie perceptions were measured immediately before the negotiation interaction started and immediately after the negotiation (but before participants were able to talk about their profit schedules or exchange them). Fixed-pie perceptions were assessed as in past research (e.g., L. L. Thompson & Hastie, 1990). At each measurement, participants were presented with a profit schedule without the points between brackets and were asked to fill in the points they thought their opposing party would get for each of the contract levels specified. Participants were permitted to use their own profit schedules to make inferences. We calculated fixed-pie perceptions by subtracting the number of points attributed to the opponent on the two integrative issues (interest and warrantee) from the points in the participant's own profit schedule. For example, on the interest issue (pay-off between 0 and 1,600 points; see Table 1), if the buyer fills in that the seller gets between 1,600 and 0 points in increments of 400, the difference between own and (presumed) other's pay-off is 0 (i.e., [1,600 − 0] + [1,200 − 400] + [800 − 800] + [400 − 1,200] + [0 − 1,600]). In other words, a score of zero would indicate the participant has a fixed-pie perception. If, in contrast, the buyer fills in that her seller gets between 4,000 and 0 points in increments of 1,000 (thus correctly perceiving integrative potential), the absolute difference between own and (presumed) other's pay-off is 6,000 (i.e., [1,600 − 0] + [1,200 − 1,000] + [800 − 2,000] + [400 − 3,000] + [0 − 4,000]). Because there are two integrative issues, the total deviance between self and other is 12,000 per negotiator when the negotiator accurately perceives integrative potential and 0 in the case of (perfect) fixed-pie perceptions. Three participants appeared to have made wild guesses and had scores that deviated extremely from the mean. The scores from these participants were replaced by a score that was two standard deviations from the overall mean (excluding these participants did not affect the results, however).

Information exchange and competitive behavior were assessed from the tape recordings. These were transcribed, and, using well-established coding schemes, speaker turns were coded for information exchange (asks for information about other's priorities and preferences, gives information about preferences and priorities) and for competitive behaviors (making positional commitments, using persuasive arguments to bolster one's own position, using threats, making derogatory remarks; De Dreu, Giebels, & Van de Vliert, 1998; Weingart, Hyder, & Prietula, 1996). Both categories were coded reliably by two judges blind to hypotheses and experimental conditions (.71 < Cohen's *k*s < .86). To correct for differences between dyads in the amount of speaking turns per category, we divided the observed number by the total number of speaking turns (cf. De Dreu et al., 1998; Weingart et al., 1996).

We also assessed social motivation. Past research suggested that social motivation (whether the negotiator adopts an egoistic or prosocial goal in the negotiation) is unrelated to the negotiator's nondirectional motivation to process information systematically (De Dreu et al., 1999; see Footnote 1), yet it may influence the revision of fixed-pie perceptions (cf. Pruitt, 1990). To verify this possibility in the current research and to be able to exclude social motivation as a viable alternative for our results, we gave participants a short questionnaire at the end of the negotiation. The questionnaire asked how important and valuable other's interests and outcomes were, to what extent one tried to serve other's interests and outcomes, and to what extent one was concerned with other's outcomes (all 1 = *not at all* to 5 = *a great deal*). Ratings were averaged in one index (Cronbach's $\alpha = .79$).

Joint outcome was calculated by summing the points to the buyer and to the seller on all four issues. The closer this figure approached 8,000, the more the negotiators integrated own and other's interests. Ten dyads failed to reach agreement within the time allotted. Process accountability did not influence impasse, $\chi^2(1, N = 51) = 1.61$, *ns*. Following the advice of Tripp and Sondak (1992), we excluded the impasse dyads from further analyses.

Results

Treatment of the data and manipulation check. Data within dyads were dependent, and negotiator role did not interact with experimental manipulations on any of the dependent measures. Hence, data were collapsed over role, and the dyad was used as the unit of analysis.

Participants were asked to indicate whether or not they were accountable to others for the negotiation process (1 = *yes;* 2 = *no*). All participants answered in line with the manipulation. Table 2 presents the zero-order correlations between the dependent variables. Social motivation and competitive behavior were negatively correlated and had the predicted (albeit nonsignificant) relations with joint outcomes from the negotiation. As expected, information exchange was positively correlated with joint outcomes. Although not very strong, fixed-pie perceptions at the end of the negotiation were negatively related to competitive behavior and positively related to social motivation. This is consistent with the idea that social motivation affects the extent to which negotiators revise their fixed-pie perceptions (Pruitt, 1990). Most important for current purposes, however, is that the correlations for fixed-pie perceptions and joint outcomes replicate the pattern observed in past research. Consistent with L. L. Thompson and Hastie (1990), fixed-pie perception before negotiation was not correlated with joint outcomes, whereas fixed-pie perception at the end of the negotiation was.

Competitive behavior, information exchange, and social motivation. Before we tested our hypotheses, we explored the effects of process accountability on information exchange, competitive behavior, and social motivation. Past research suggested that nondirectional motivation and social motivation in negotiation operate independently, implying that no effects of process accountability should be found. Indeed, analyses of variance (ANOVAs) with the indexes of competitive behavior, information exchange, and social motivation as dependent variables and process accountability

Table 2
Zero-Order Correlations for All Dependent Variables

	1.	2.	3.	4.	5.	6.
1. Social motivation[a]	—	−.35**	.18	.01	.17	.19
2. Competitive behavior		—	−.13	−.08	−.13	−.20*
3. Information exchange			—	.07	.19	.23*
4. Fixed-pie perceptions (before)[b]				—	.54***	.17
5. Fixed-pie perceptions (after)[b]					—	.42***
6. Joint outcomes						—

[a] Social motivation is coded such that higher scores reflect a more prosocial motivation. [b] Fixed-pie perceptions are coded such that lower scores reflect stronger fixed-pie perceptions.
* $p < .10$. ** $p < .05$. *** $p < .01$.

as the independent variable revealed no effects, all $F(1, 39) < 1.73$, *ns*.

Fixed-pie perception. Hypothesis 1 predicted that process accountability would dilute fixed-pie perceptions and increase the negotiator's accuracy about the opponent's pay-offs. This hypothesis was tested by submitting the prenegotiation and postnegotiation fixed-pie perception scores to a 2 × 2 (Process Accountability × Time of Measurement) ANOVA with process accountability as the between-dyads factor and time as a repeated measures factor. Results revealed a main effect for time, $F(1, 39) = 8.52$, $p < .01$, showing that fixed-pie perceptions dissipated over time and that judgment accuracy increased. This main effect was qualified by an interaction between time and process accountability, $F(1, 39) = 3.79$, $p < .05$. Means are given in Table 3. Consistent with Hypothesis 1, fixed-pie perceptions were weaker under process accountability, but only after negotiation ($p < .05$) and not before the negotiation ($p > .25$).

Joint outcomes. Hypothesis 2 predicted that process accountability would lead negotiators to achieve more integrative agreements. Consistent with this prediction, negotiators under process accountability reached higher joint outcomes ($M = 7{,}060$) than negotiators not held accountable ($M = 6{,}257$), $F(1, 39) = 9.27$, $p < .004$.

Fixed-pie perceptions and joint outcomes. Hypothesis 3 predicted that the effect of process accountability on joint outcomes would be due to the greater revision of fixed-pie perceptions under process accountability. To test this hypothesis, we analyzed joint outcomes as a function of process accountability with the residual of postnegotiation fixed-pie perceptions as a covariate after prenegotiation judgment accuracy had been partialled out. Results revealed a significant regression, $\beta = .35$, $F(1, 38) = 8.02$, $p < .007$. Although the main effect for process accountability remained significant, $F(1, 38) = 5.58$, $p < .025$, the amount of variance in joint outcomes explained by process accountability dropped from $R^2 = .25$ to $R^2 = .14$. The predicted change in beta from simple to multiple regression (for a discussion, see Kenny, Kashy, & Bolger, 1998) also was significant, $z = 1.67$, $p < .05$ (one-tailed; we used the updated formula presented at Kenny's website; see http://nw3.nai.net/~dakenny/mediate.htm). Thus, there is some evidence to conclude that the reduction in fixed-pie perceptions under process accountability partially mediates the effect of process accountability on joint outcomes (cf. Baron & Kenny, 1986).[3]

Table 3
Fixed-Pie Perceptions Before and After the Negotiation as a Function of Process Accountability

	Fixed-pie perceptions[a]	
Process accountability	Before negotiation	After negotiation
No	3,485[b]	4,204[b]
Yes	3,672[b]	7,268[c]

[a] Fixed-pie perceptions range between 0 and 12,000; higher scores indicate greater judgment accuracy. [b,c] Means in the same column with different superscripts differ at $p < .05$.

Discussion

The results of Experiment 1 are consistent with the argument that nondirectional motivation to engage in systematic processing of information leads to revisions in fixed-pie perceptions during negotiation and to more integrative agreements. These results are consistent with findings by L. L. Thompson (1995) and show that her findings generalize to actual, face-to-face negotiation. Moreover, results reveal, for the first time, that variation in nondirectional motivation affects not only perceptions but also the quality of negotiated agreements. We return to these issues in the General Discussion section.

In the introduction, we distinguished between social motivation (prosocial vs. individualistic motivation) that influences the amount of information negotiators exchange and nondirectional motivation that influences the extent to which negotiators systematically process this information. Past research by De Dreu et al. (1999) revealed that individual differences in social motivation (i.e., social value orientations) are not related to individual differences in nondirectional motivation (i.e., need for cognitive closure). Experiment 1 yielded similar results. Process accountability did not influence social motivation, competitive behavior, and information exchange, but it did influence the negotiator's tendency to hold on to his or her fixed-pie perceptions. Thus, we have mounting evidence to conclude that in negotiation, social and nondirectional motivations are unrelated and operate independently.

[3] An alternative procedure is to enter the difference between post- and prenegotiation fixed-pie perceptions as a covariate. This alternative procedure is less than optimal because of the problems associated with difference scores (Stevens, 1992). Nevertheless, its results yield identical conclusions.

The reader might argue that our manipulation of process accountability not only increased participants' motivation to process information in a systematic way but also increased their desire to make a good impression and, accordingly, to reach good outcomes (cf. outcome accountability; Lerner & Tetlock, 1999). If true, participants under process accountability would have had higher aspirations than participants in the control condition, consequently would have been more resistant to concession making, and might have worked harder to find integrative solutions that satisfied both their own and the other's high aspirations. Research by Ben-Yoav and Pruitt (1984) and Carnevale, Pruitt, and Britton (1979), for instance, has shown that negotiators who feel accountable to their constituents have higher aspirations and make fewer concessions than negotiators not held accountable by their constituents. In other words, the question is whether our manipulation of process accountability truly focused participants on the process rather than on the outcome of the negotiation. We believe it did because if participants had been focused on process and outcomes, a different pattern of results would have been obtained. That is, if participants in the process accountability condition had had higher aspirations and stronger desire to make good impressions, this should have influenced levels of competitive behavior, information exchange, and social motivation. Because our manipulation of accountability did not affect competitive behavior, information exchange, or social motivation, we feel comfortable concluding that we manipulated process accountability instead of outcome accountability. By implication, we believe that the results in Experiment 1 cannot be (fully) explained in terms of different aspiration levels between the control and the experimental condition.

Experiment 2

From a theoretical point of view, we had no reason to expect that process accountability would influence the amount of information exchanged during negotiation, only that it would influence the extent to which negotiators processed the information that became available during negotiation. Although the results of Experiment 1 were consistent with this reasoning (i.e., process accountability had no effects on the amount of information exchanged), we cannot exclude the possibility that our measure of information exchange was not sensitive enough to detect real differences. To deal with this issue, we used a design that held the amount of information about preferences and priorities constant across different levels of process accountability in Experiment 2. Doing so allowed us to unequivocally ascribe effects of process accountability to information processing rather than information exchange.

Assuming the amount of information exchanged is not responsible for changes in fixed-pie perceptions, two possible explanations for the effects observed in Experiment 1 seem feasible. The first is that process accountability influenced the extent to which negotiators encoded the information exchanged during negotiation. Under process accountability, negotiators attend more to the information that is exchanged, incorporate this new information into their understanding of the negotiation task, and develop more accurate understanding of their opponent's pay-off structure. This encoding explanation follows Tetlock's (1992) analysis of the effects of (process) accountability: To preempt criticism, decision makers carefully consider and encode all relevant information provided to them.

Research by E. P. Thompson, Roman, Moskowitz, Chaiken, and Bargh (1994) suggests another possibility. Their study concerned the influence of covert priming on person perception and examined the extent to which people were able to accurately recode information about the target person. In their experiments, some participants were placed under process accountability prior to reading person information, and other participants were placed under process accountability after they had read the person information. Results showed that predecisional accountability reduced the influence of the covert prime and, consequently, that participants formed more evenhanded evaluations of the target person. Interestingly, however, postdecisional accountability had similar effects—it reduced the influence of the covert prime and led to more evenhanded evaluations. Thus, people are able to construe a posteriori information they have previously encoded (see also Sedikides, 1990), and process accountability enhances such recoding.

In Experiment 1, negotiators under process accountability expected to be interviewed about the reasons underlying their decisions and, therefore, may have been motivated to recode information about the task as well as possible to be prepared for the interview. Thus, revisions of fixed-pie perceptions under process accountability may have been due to (a) better encoding of information during negotiation, (b) better recoding of the exchanged information after the negotiation had been completed, or (c) better encoding as well as recoding.

To examine these explanations empirically, we gave participants in Experiment 2 the same instructions as in Experiment 1: They learned that they would negotiate the transaction of a used car, which required an agreement on four issues. While reading the instructions, participants received information about their own pay-offs only and filled out the measure of fixed-pie perceptions. Subsequently, participants received full information about their opposing negotiator's pay-offs and, after a brief filler task, were asked to complete the measure of fixed-pie perceptions once again. Because participants had received full information about the other's pay-offs, we expected a revision of fixed-pie perceptions between the first and the second measure. To examine whether process accountability enhanced encoding, recoding, or both, we manipulated process accountability (as in Experiment 1) either prior to or after participants had received full information about their opponent's pay-offs. If increased encoding were responsible for the greater judgment accuracy, process accountability should have resulted in fewer fixed-pie perceptions only when manipulated before full information was provided. If improved encoding were not effective, process accountability should have resulted in fewer fixed-pie perceptions regardless of whether it was manipulated before or after full information was provided. Finally, to examine whether recoding alone could be responsible for the revision of fixed-pie perceptions, we told participants right before they completed the second measure of fixed-pie perceptions that they had or had not been selected for the interview. If recoding were responsible for the revision of fixed-pie perceptions, process accountability should have resulted in fewer fixed-pie perceptions only when participants still anticipated the interview. If recoding were not responsible, process accountability should have resulted in fewer fixed-pie perceptions regardless of whether participants still anticipated the interview or not.

Method

Design and participants. The design had five conditions. In all conditions, participants (a) received the standard instructions, (b) completed the fixed-pie perception measure before they received any information about their opponent's pay-offs, (c) received full information about their opponent's pay-offs, (d) completed a 10-min filler-task, (e) completed the fixed-pie perception measure once again, and (f) answered manipulation checks and were debriefed. In the preinformation accountability/interview anticipated condition, process accountability was manipulated before full information was provided, and, right before the second fixed-pie perception measure, participants were told that they had been selected for the interview. In the preinformation accountability/no interview anticipated condition, process accountability was manipulated before full information was provided, and, right before the second fixed-pie perception measure, participants were told that they had not been selected for the interview. In the postinformation accountability/interview anticipated condition, process accountability was manipulated after full information was provided, and, right before the second fixed-pie perception measure, participants were told that they had been selected for the interview. In the postinformation accountability/no interview anticipated condition, process accountability was manipulated after full information was provided, and, right before the second fixed-pie perception measure, participants were told that they had not been selected for the interview. To obtain a baseline, we included a fifth condition, in which process accountability manipulations were omitted.

One-hundred twenty-five male and female undergraduate students at the University of Amsterdam participated in the experiment, for which they received a one-hour credit to fulfill a course requirement or 10 Dutch guilders (approximately U.S. $5). Participants were randomly allocated to experimental conditions. Participant sex and participation inducements (course credit or payment) had no effects and are not discussed further.

Procedure and experimental tasks. The procedure was similar to the one used in the first experiment. Because, in Experiment 1, no effects for role were observed, all participants received the buyer role. Participants came in even numbers to the laboratory where they received an information package containing negotiation materials (role instructions, background information, and their own profit schedule) and information intended to manipulate process accountability. These materials were the same as used in Experiment 1. In the control condition, participants read through the instructions and completed the fixed-pie perception measure (see Experiment 1). Subsequently, the experimenter collected the materials and gave participants a second booklet that contained their opponent's issue chart (see Table 1) and a 10-min filler task that was neither empirically nor theoretically related to the current experiment. After the filler task, the experimenter collected the instructions, and gave the participants a third booklet. Participants once again were asked to complete the fixed-pie perception measure, then answered some manipulation checks (see below) and some questions about their social motivation in the upcoming negotiation. On completion, participants were told that the study was over and that there would be no real negotiation. Participants were fully debriefed and compensated for participation.

In the other conditions, the exact same procedure was followed with the following unique alterations (see also Figure 1). In the preinformation accountability/interview anticipated condition, participants received the manipulation of process accountability (see Experiment 1) before they started to read the instructions (i.e., in the first booklet). In addition, together with the third booklet, they received a note from the experimenter indicating that their participant number had been randomly selected for the interview and that immediately after the experiment, a date would be set for the interview. In the preinformation accountability/no interview anticipated condition, participants received the manipulation of process accountability before they started to read the instructions. In addition, together with the third booklet, they received a note from the experimenter indicating that from a random selection, their participant number had not been selected for the interview and that after the experiment, no further actions would be taken. In the postinformation accountability/interview anticipated condition, participants received the manipulation of process accountability immediately after they had received full information about their opposing negotiator's pay-offs (i.e., in the second booklet). In addition, together with the third booklet, they received a note from the experimenter indicating that their participant number had been randomly selected for the interview and that immediately after the experiment, a date would be set for the interview. In the postinformation accountability/no interview anticipated condition, participants received the manipulation of process accountability immediately after they had received full information about their opposing negotiator's pay-offs (i.e., in the second booklet). In addition, together with the third booklet, they received a note from the experimenter indicating that from a random selection, their participant number had not been selected for the interview and that after the experiment, no further actions would be taken.

Dependent measures. Fixed-pie perceptions were measured twice (in the first booklet before the receipt of full information and afterwards, in the third booklet) using the same methods and procedures used in Experiment 1. Four participants appeared to have made wild guesses and had scores that deviated extremely from the mean. The scores from these participants were replaced by a score that was two standard deviations from the overall mean (as in Experiment 1, excluding these participants did not affect the results, however). To check the adequacy of the manipulation of process accountability, we asked participants at the end of the third booklet whether they (a) had to account for their decisions during negotiation in an

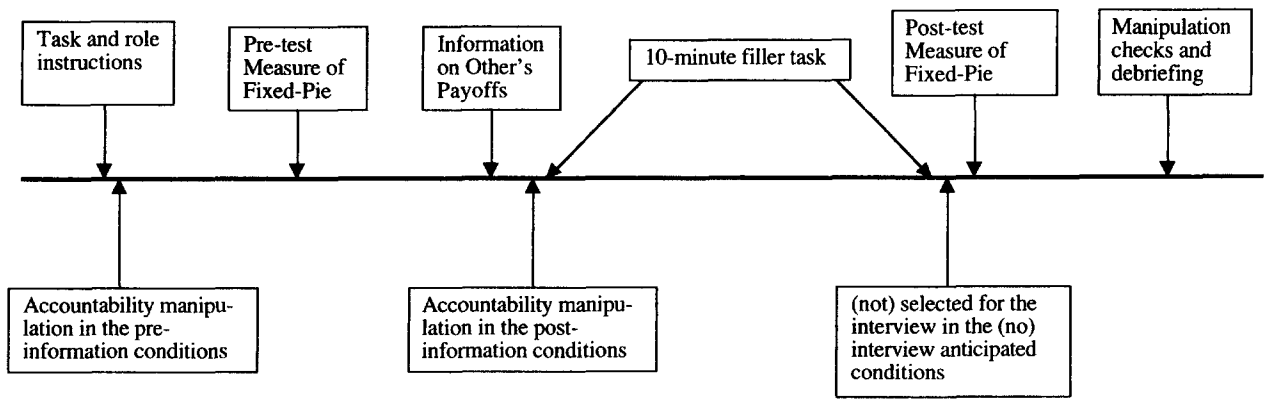

Figure 1. Overview of (the timing and ordering of) experimental manipulations in Experiment 2.

interview, (b) had, while answering questions, taken into account that they might be interviewed about why they gave certain answers, and (c) would, during the upcoming negotiation, be motivated to make thorough and well-conceived decisions. Questions could be answered on 5-point scales ranging from (1) *certainly* to (5) *not at all.* Ratings were averaged into one index (Cronbach's α = .67). As in Experiment 1, we finally asked participants about their social motivation in the upcoming negotiation to check whether process accountability would influence an egoistic or prosocial motivation. The questions were the same as used in Experiment 1, and ratings were averaged into one index (Cronbach's α = .83).

Results

Manipulation check. A one-way ANOVA with condition as the between-participants variable and the ratings on the manipulation check as dependent variable yielded a significant main effect for condition, $F(4, 120) = 3.53$, $p < .01$. Tukey tests ($p < .05$) revealed that the preinformation accountability/interview anticipated condition ($M = 3.31$) and the postinformation accountability/interview anticipated condition ($M = 3.46$) did not differ from each other, whereas both differed significantly from the preinformation accountability/no interview anticipated condition ($M = 2.92$), the postinformation accountability/no interview anticipated condition ($M = 2.93$), and the control condition ($M = 2.77$). The latter three conditions did not differ from one another. Thus, participants felt more accountable and were more motivated to process information systematically when process accountability was manipulated and participants had been selected for the interview.

Social motivation. Before we analyzed the results for fixed-pie perceptions, we explored effects of process accountability manipulations on social motivation. Consistent with Experiment 1, experimental condition had no effect on the participant's tendency to adopt a prosocial motivation, $F(4, 120) < 1$, *ns.* This result converges with earlier findings suggesting that social and nondirectional motivations in negotiation operate independently.

Fixed-pie perceptions. To examine whether encoding or recoding was responsible for the revision of fixed-pie perceptions under process accountability, we submitted the preinformation and postinformation fixed-pie perceptions to a 5 × 2 (Condition × Time of Measurement) ANOVA with the time as a repeated measures factor and condition as a between-participants factor. Results revealed a main effect for time, $F(1, 120) = 111.84$, $p < .001$, showing weaker fixed-pie perceptions at the second measure. The main effect for time was qualified by an interaction between time and condition, $F(4, 120) = 2.54$, $p < .05$. Cell means are given in Table 4. Follow-up analyses revealed no effect for condition on the preinformation fixed-pie perceptions, $F(4, 120) = 1.50$, $p > .20$, but a significant effect for condition on the postinformation fixed-pie perceptions, $F(4, 120) = 2.49$, $p < .05$. Tukey tests ($p < .05$) revealed that the preinformation accountability/interview anticipated condition resulted in weaker fixed-pie perceptions and greater judgment accuracy ($M = 8{,}054$) than the postinformation accountability/interview anticipated condition ($M = 4{,}367$), the postinformation accountability/no interview anticipated condition ($M = 4{,}524$), and the control condition ($M = 4{,}971$). The preinformation accountability/no interview anticipated condition ($M = 6{,}584$) took an intermediate position that differed nonsignificantly, but marginally ($p < .10$), from any of the other conditions. This pattern of results indicates increased encoding of information to be the primary factor underlying the revision of fixed-pie perceptions in the case of process accountability. Recoding appears not to contribute in itself but tends to strengthen the effect of encoding.

Table 4
Fixed-Pie Perceptions Before and After Information About Other's Pay-offs Is Given, Broken Down for Experimental Conditions

Condition	Fixed-pie perceptions[a]	
	Before information	After information
Preinformation accountability/ interview anticipated	1,704[b]	8,054[b]
Preinformation accountability/ no interview anticipated	471[b]	6,584[b,c]
Postinformation accountability/ interview anticipated	528[b]	4,367[c]
Postinformation accountability/ no interview anticipated	1,834[b]	4,524[c]
Control	1,044[b]	4,971[c]

[a] Fixed-pie perceptions range between 0 and 12,000; higher scores indicate greater judgment accuracy.
[b,c] Means in the same column with different superscripts differ at $p < .05$.

Discussion

Results of Experiment 2 were consistent with those obtained in Experiment 1 in several ways. As in Experiment 1, we did not find effects of experimental manipulations of process accountability on measures of social motivation, once again suggesting that nondirectional and social motivations are unrelated (cf. De Dreu et al., 1999). Second and more important, compared with the control condition, fixed-pie perceptions were weaker when process accountability was manipulated prior to information. This finding is important because, contrary to Experiment 1, we held constant the amount of information participants received about their opponent's pay-offs. This means that we can conclude that process accountability influences fixed-pie perceptions through increased processing of information rather than through increased information exchange.

A second goal of Experiment 2 was to determine whether effects of process accountability on revisions in fixed-pie perception are due to increased encoding of information, to increased recoding, or both. By manipulating the timing of the manipulation of process accountability (before or after information about other's pay-offs was given), as well as by telling participants prior to the second measure of fixed-pie perceptions whether or not they would indeed be interviewed, we were able to distinguish between encoding and recoding effects. Results showed weaker fixed-pie perceptions when process accountability was induced before rather than after participants received information about other's pay-offs, providing evidence for encoding rather than recoding. This effect was particularly strong when participants learned prior to the second measure of fixed-pie perceptions that they had been selected for the interview and was somewhat weaker when they learned that they had not been selected for the interview. This effect may

suggest that recoding is at work as well, but only when thorough encoding precedes it.

General Discussion

Fixed-pie perceptions constitute a pervasive barrier to integrative negotiation. In the current research, a majority of the negotiators entered the negotiation with fixed-pie perceptions, and those who remained committed to them achieved less integrative agreements.[4] As such, the current study corroborates past research showing that perceptual inaccuracies in negotiation may seriously limit negotiator success (Bazerman & Neale, 1983; L. L. Thompson & Hastie, 1990). More importantly, however, the current research contributes to an understanding of the motivational factors underlying a negotiator's tendency to revise his or her fixed-pie perceptions. Experiment 1 suggested that nondirectional motivation to engage in thorough, systematic processing of information released fixed-pie perceptions during negotiation, resulting in more integrative agreements. Experiment 2 clarified that this revision of fixed-pie perceptions under process accountability was due to better encoding of the information. Our results have implications for thinking about motivation in negotiation, as well as for dual-process models about human information processing. Below, we consider these implications in some detail.

Cognition and Motivation in Negotiation

To understand why negotiators fail to reach integrative agreements, research and theory have traditionally focused on motivational factors or on cognitive biases and heuristics (Kramer & Messick, 1995). In fact, even quite recent reviews of the negotiation literature have been able to discuss these two streams of research in isolation from one another (see, e.g., Carnevale & Pruitt, 1992; Neale & Bazerman, 1991). However, the walls between the motivational and cognitive approaches to negotiation have begun to break down (see, e.g., Carnevale & Probst, 1998; De Dreu & Boles, 1998; De Dreu et al., 1999; Gelfand & Christakopoulou, 1999; O'Connor, 1997; L. L. Thompson, 1995). The bulk of this new research has considered how social motivation influences cognitive processes in negotiation, that is, it has examined how negotiators with prosocial as opposed to individualistic motivation perceive the negotiation task, including their opponent's pay-off structure. The results of these studies have shown that social motivation in negotiation influences the amount of information about preferences and priorities negotiators exchange, leading them toward particular conclusions consistent with their motivational goals.

The current research complements this line of inquiry by focusing on nondirectional motivation. On the basis of dual-process models (Chaiken & Trope, 1999; Smith & DeCoster, in press), we hypothesized that process accountability would motivate negotiators to engage in thorough, systematic processing of information, leading them to discover their fixed-pie perceptions to be erroneous. This in turn was expected to result in more accurate perceptions of their opponent's pay-offs and, ultimately, in more integrative agreements. Some initial evidence was provided by L. L. Thompson (1995) who had participants observe a videotaped negotiation between their representative and his or her opponent. Consistent with current findings, L. L. Thompson's results showed that participants had fixed-pie perceptions but less so when they were under process accountability. Experiment 1 replicated this finding when participants engaged in a face-to-face negotiation in which they were able to say and do whatever they deemed necessary and appropriate. This change in setting is important in that it increases the ecological validity of the negotiation context because the interaction is natural and in a context that is familiar and motivating to participants (cf. Morris, Larrick & Su, 1999). In addition, the current research allowed us to go beyond perceptions and instead examine the interplay between motivation, (revisions of) fixed-pie perceptions, behavioral interaction, and resultant outcomes. Finally, the current research enabled us to uncover why process accountability produced revisions in fixed-pie perceptions. That is, Experiment 2 revealed that process accountability has its effects through increased encoding (and to some extent, recoding) of information, rather than through increased exchange of information. All in all, these results allow us to conclude that fixed-pie perceptions are a pervasive barrier to integrative negotiation only to the extent that negotiators lack motivation to engage in thorough, systematic encoding of the information exchanged during negotiation.

The conclusion that fixed-pie perceptions hinder integrative negotiation only in case of low nondirectional motivation implies that past research finding strong negative correlations between fixed-pie perceptions and integrative agreements primarily involved participants with low nondirectional motivation. Such would be consistent with the general notion in social and cognitive psychology that individuals do not engage in systematic, thorough processing of information unless they are explicitly motivated to do so (cf. Chaiken & Trope, 1999). It cannot be excluded, however, that studies finding a negative correlation between fixed-pie perceptions and integrative agreements implicitly or explicitly provided participants with individualistic or competitive motivation, thereby reducing information exchange during negotiation. In such cases, nondirectional motivation to engage in systematic processing of information may have had little effect on fixed-pie perceptions, simply because there was little information to be processed. In fact, this conclusion would be consistent with research showing that negotiators with an individualistic motivation hold on to their fixed-pie perceptions (see, e.g., Carnevale & Isen, 1986; Gelfand & Christakopoulou, 1999; Pruitt, 1990). In addition, much of the past research on fixed-pie perceptions used MBA students, who have been shown to be relatively competitive in their orientation toward negotiation (cf. De Dreu & McCusker, 1997).

Recently, De Dreu et al. (2000) proposed a motivated information-processing model of negotiation. It argues that individuals have or adopt an egoistic or prosocial motive that drives the information they provide, attend to, assimilate, and dismiss. Those with an egoistic motive convey contentious, persuasive arguments intended to bolster their own point of view and to dismiss the interests of their opposing negotiator. In contrast,

[4] We counted the number of participants with a perfect fixed-pie perception at the beginning of the negotiation. In Experiment 1, 52.8% had a perfect fixed-pie perception, and in Experiment 2, 65.2% started with a perfect fixed-pie perception. Note that this measure is conservative in that it does not allow for any mistakes in participant's assessments. Most likely, actual percentages were higher.

individuals with a prosocial motive tend to convey insights into other's interests and to seek and provide information about each other's preferences and priorities. The current research qualifies and expands this motivated information-processing model of negotiation in two ways. First, it distinguishes social motivation from nondirectional motivation and provides evidence that these two motivations operate independently in the context of negotiation. That is, the analyses revealed no effects of process accountability on postnegotiation measures of social motivation, or on competitive behavior or information exchange during negotiation. This is consistent with other findings that no relationship exists between individual differences in social value orientation (social motivation) and individual differences in need for cognitive closure (cf. nondirectional motivation; De Dreu et al., 1999). These findings are interesting because they suggest a more fine-grained analysis of the effects of motivation on negotiator cognition, behavior, and outcomes.

Second, the model proposed by De Dreu et al. (2000) does not specify how nondirectional and social motivation jointly predict integrative negotiation. With regard to the revision of fixed-pie perceptions, current results offer some clues. Past research revealed some support for the idea that social motivation leads to revisions in fixed-pie perceptions because social motivation influences information exchange during negotiation (Carnevale & Isen, 1986; Gelfand & Christakopoulou, 1999; but see Kimmel et al., 1980; O'Connor & Carnevale, 1997). Our study shows that nondirectional motivation leads to revisions in fixed-pie perceptions because nondirectional motivation influences the encoding of information that is exchanged during negotiation. This suggests that social motivation influences negotiator perception because it influences the amount of information that is exchanged during negotiation whereas nondirectional motivation influences the depth of information processing. Thus, at least with respect to fixed-pie perceptions, social and nondirectional motivations tend to lead to the same outcome but by different routes (i.e., greater information exchange vs. better encoding of the information that is exchanged).

Fixed-pie perceptions are but one of the many (cognitive) barriers to integrative negotiation (for a recent review, see Bazerman, Curhan, Moore, & Valley, 2000), and the motivated information-processing model of negotiation suggests how these barriers may be leveled. To test the generality of the currently proposed framework, future research could examine the joint influence of social and nondirectional motivations on the extent to which (cognitive) barriers such as gain–loss framing, overconfidence, and anchoring-and-adjustment affect integrative negotiation. We expect these barriers to be far less influential when negotiators (a) have a prosocial rather than individualistic motivation and (b) have high rather than low nondirectional motivation to engage in thorough, systematic processing of information.

Dual-Process Models

The motivated information-processing model of negotiation discussed above builds on dual-process models developed to understand how individuals solve logical problems, consider persuasive arguments, or form impressions about others (Chaiken & Trope, 1999; Smith & DeCoster, in press). The current research successfully applied key notions from these models about the influence of nondirectional motivation and showed its predictive validity in situations of mixed-motive conflict where individuals interact and need to coordinate their activities. We believe this is a valuable extension because past research supporting dual-process models confined itself to situations in which (non)social stimuli were presented to individuals who were not interacting (see also Lerner & Tetlock, 1999). Past and current evidence together suggest that dual-process models accurately describe and explain psychological phenomena ranging from memory systems (Smith & DeCoster, in press), by way of individual judgment and decision making (Chaiken & Trope, 1999; Lerner & Tetlock, 1999), to interpersonal behavior and outcomes in mixed-motive conflict.

Although research evidence is overwhelmingly consistent with contemporary conceptions of the human memory system (McClelland, McNaughton, & O'Reilly, 1995; Smith & DeCoster, in press), the parsimony of dual-process models has recently been challenged (Kruglanski & Thompson, 1999). The key point is that one may conceive of two qualitatively different modes for processing information, as is assumed in the dual-process models, or instead take a more quantitative perspective assuming that people differ only in the extent to which they process information in a systematic way. The latter position is consistent with Kruglanski's lay epistemic theory (Kruglanski, 1989; Kruglanski & Webster, 1996), which states that individuals differ in their desire for cognitive closure. Those with high need for cognitive closure tend to jump to conclusions on the basis of incomplete evidence and to rely on simplified rules of thumb to make judgments and decisions. Those with low need for cognitive closure tend to postpone conclusions until all relevant evidence is processed and incorporated in their understanding of the situation. Need for cognitive closure reduces the tendency to engage in systematic processing of information, and both personality and situational influences contribute to the individual's need for cognitive closure (Kruglanski & Webster, 1996). The present study was designed to understand the role of nondirectional motivation in negotiation and was not designed to discriminate between dual-process models and lay epistemic theory. More research is needed to examine whether nondirectional motivation in negotiation produces qualitatively different ways of information processing or whether it produces differences in the extent to which people engage in systematic processing of information.

Research in the realm of dual-process models suggests that under particular circumstances, nonsystematic, heuristic processing of information may actually be more beneficial than systematic, deliberate information processing (for a review, see Chaiken & Trope, 1999). This seems to run counter to the basic message contained in the current data, namely, that higher levels of nondirectional motivation increase the quality of negotiated agreements through better encoding of information and concomitant revisions of fixed-pie perceptions. It is important to realize that the current studies were conducted in a setting where fixed-pie perceptions were truly inaccurate. Although situations with integrative potential are very likely (Pruitt, 1981; Raiffa, 1982), some negotiations are truly distributive and one party's outcomes are indeed diametrically opposed to the opposing negotiator's outcomes. In such situations, fixed-pie perceptions are accurate, and it may be that nonsystematic, heuristic processing of information results in more efficient and less effortful negotiation processes than systematic, deliberate information processing yielding nothing but confirma-

tion of one's original fixed-pie perceptions. Future research is needed to examine whether and when heuristic information processing leads to negotiation processes and outcomes superior to those of systematic, deliberate information processing.

Conclusion

The present research shows that negotiators under process accountability engage in better encoding of information exchanged during negotiation, which releases their fixed-pie perceptions and enables them to reach mutually beneficial, integrative agreements. These findings increase the understanding of the motivational factors underlying an important and pervasive barrier to integrative negotiation, provide a building block in a more general motivated information-processing model of negotiation, and extend dual-process models to the important interpersonal domain of mixed-motive conflict. Although prosocial versus egoistic goals determine the amount of information negotiators exchange, nondirectional motivation elicited by process accountability determines the extent to which opposing negotiators engage in thorough, systematic processing of information. Thus, increasing nondirectional motivation may help negotiators to discover new integrative potential and thereby create more beneficial agreements for all parties involved.

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Received March 31, 2000
Revision received June 22, 2000
Accepted July 3, 2000 ■